

### **REMARKS**

Reconsideration of the outstanding Office Action is respectfully solicited.

Applicants request reconsideration of the Examiner's indication that the outstanding Office Action is "final", in view of the citation of Boileau et al and Haaland et al, not previously of record. In applicants' view, two sections of the MANUAL OF PATENT EXAMINING PROCEDURE suggest that the Office does not sanction "finality" in this case at this time.

**Section 706.07(a)** states

"A second..action on the merits in any application or patent i..should not be made final if it includes a rejection, on prior art not of record, of any claim amended to include limitations which should reasonably have been expected to be claimed. See MPEP §904...".

**Section 904.02**, in pertinent part states,

"The search should cover the claimed subject matter and should also cover the disclosed features which ***might reasonably be expected to be claimed.*** [emphasis added.]"

The request for reconsideration, is based on the presentation of Claim 43, which in applicants' view raises no new issue [although the U.S. PTO may take a different view]. Accordingly, applicants submit the following facts which show that the amendments herein raise no new issues, in the sense that the U.S. PTO Examiner has considered them before. One amendment of Claim 43 is based on claims 60 and 62 [previously pending] and incorporates two of the three species of those claims; the insertion into Claim 43 is no different from an hypothetical amendment of each of those claims to delete "1-hole,". Entrance of the Amendment is

respectfully solicited. The reference to gun ammunition flows therefrom. The insertion of the phrase wherein the coating reduces the temperature gradient of a propellant charge during combustion has been at issue for some time now: For example, in the March 3, 2004 AMENDMENT, applicants stated,

"The coating in Applicants' case is not in the form of a mixture, but is present as a surface layer on the propellant powder grain and the combustion channels (see enclosed Figures 1 to 3, described above).

**The object of the method** is the production of propellant powders for which, in a simple manner, a flattening of the maximum gas-pressure curve is achieved in the temperature range allocated to the weapon. Drawings of the application and the results of the Examples show that the effect of Applicants' coating is to improve performance at low and normal temperatures by decreasing the gradient of temperature and pressure. In fact, scrutiny of Figures 1 and 2 reveals that the initial changes at lower temperatures causes a slope difference of positive (for coated granules of the invention) compared to a negative slope (for uncoated granules).

Previous revision of U.S. main Claim 43 emphasizes that the claims refer to the coating of the powder grains shown in the Figures of the application specification. To narrow the issue, Applicants also deleted the dependent claims 44 and 45."

As stated in that very same AMENDMENT, ...

"Claims 60 et seq.[incorporated into Claim 43] are supported by the description at specification page 11 lines 18 and 11-13 and the figures 8 and 9 of the application as filed. The claims relate to a method for the surface treatment of propellant powders (mono-, di- or tri-base propellants) for the ammunition used in barrel weapons. As reflected in Figures 7-9, the propellants granules or grains can be produced with holes or channels; the description at page 11 relates to the particular features of Figures 7-9.

Applicants have attached hereto four photographs [in color], as Figures 1-4, for the Examiner's consideration, along with a translation of the legends. Applicants representatives also have an additional set for further proceedings. Four sheets of photographs (Figures) are attached.

Figure 1 contains a grain [green in color with light blue to grey grounds].

Figure 2 contains a grain which is surface treated in accordance with the invention and a grain which contains holes and is not surface treated; the untreated grain is darker in color than the treated grain which is shiny.

Figure 3 contains a grain which is surface treated in accordance with the invention and a grain which is not surface treated; the untreated grain is blacker in color than the treated grain which is shiny.

Figure 4 is a powder.

The coating in Applicants' case is not in the form of a mixture, but is present as a surface layer on the propellant powder grain and the combustion channels (see enclosed Figures 1 to 3, described above).

**The object of the method is the production of propellant powders for which, in a simple manner, a flattening of the maximum gas-pressure curve is achieved in the temperature range allocated to the weapon. Drawings of the application and the results of**

**the Examples show that the effect of Applicants' coating is to improve performance at low and normal temperatures by decreasing the gradient of temperature and pressure.** In fact, scrutiny of Figures 1 and 2 reveals that the initial changes at lower temperatures causes a slope difference of positive (for coated granules of the invention) compared to a negative slope (for uncoated granules).

Previous revision of U.S. main Claim 43 emphasizes that the claims refer to the coating of the powder grains shown in the Figures of the application specification. To narrow the issue, Applicants also deleted the dependent claims 44 and 45.

In summary, entrance of this AMENDMENT is respectfully solicited.

II. Before consideration of the exact rejections at issue in the outstanding Office Action, the undersigned notes the following concerns [as translated] of applicants' German representatives:

[1] "In particular, the Examiner in our opinion equates the terms "surface treating" and/or "surface coating" with "mixing," which we do not consider permissible. Please see the October 20 Office Action at page 4, FIRST FULL PARAGRAPH

[2] In our previous letter from February 18, 2004, we already pointed out with sufficient detail that the invention does not involve a "mixing," but only a coating of the outside of a propellant powder grain, wherein this technique can be equated to "surface coating." Please see the October 20 Office Action at page 4.

[3] We also do not understand the Examiner's argument since he/she again mentions cellulose ester in Point 2. Please see the October 20 Office Action at page 3.

The following addresses those three concerns in paragraphs numbered [1a], [2a] and [3a], addressed seriatim and respectively below:

[1a-2a] In applicants' view, none of the references, alone or in combination, do describe surface treating the granules or grains, as recited in the rejected pending claim.

The MPEP Section 2111.01 is controlling here with respect to claim interpretation:

**"2111.01 Plain Meaning [R-1]**

THE WORDS OF A CLAIM MUST BE GIVEN THEIR "PLAIN MEANING"  
UNLESS THEY ARE DEFINED IN THE SPECIFICATION ...

Use of the gerund "surface-treating" is specific and clear; moreover, the substrate recited in the claims is clear. None of the verbs used by the PTO in the reasons for applying Willer is "surface-treating. Moreover, in applicants' view, the different words bolded above are used to accord an interpretation to the reference description, which in accordance with the dictionary usage is unavailable: Applicants rely, for the definition of the words, on THE AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE [third Edition], Houghton Mifflin Company, which defines the terms as follows:

**coat...tr.v.** 1.To provide or cover with a coat. 2. To cover with a layer, as of paint... page 363

**Disperse ...5.** to distribute (particles) evenly throughout a medium...page 537

**Layer...2.a.** A single thickness of a material covering a surface or forming an overlying part or segment page 1022

**Mix 1. to combine or blend into one mass or mixture...**

The word "disperse " is not the same as --surface treating--; nor is the word "mix" the same as surface-treating. This can be seen from the definitions above. There is no reasonable basis for construing --surface-treating-- to be the verb "dispersing" or to be the word "mix" or "mixture"; or at least no reasonable basis is provided in this record.

To the foregoing [which was presented in an earlier AMENDMENT], it should be added that the U.S. PTO position, in the October 2004 Office Action, page 4 ---concerning the phrase "surface treating"--- simply deletes the word 'surface' from the phrase and treats the claim(s) as

simply requiring --treating--. Please see the October 26, 2004 Office Action at page 4, wherein the definition provided is for the word "treat", not for the phrase --surface treating-- .

[3a] We want to point out that this material has for some time been deleted from our claim 43.

#### SUBJECT MATTER AS A WHOLE

The coating in Applicants' case is not in the form of a mixture, but is present as a surface layer on the propellant powder grain and the combustion channels (see enclosed Figures 1 to 3, described above).

The object of the method of the claims is the production of propellant powders for which, in a simple manner, a flattening of the maximum gas-pressure curve is achieved in the temperature range allocated to the weapon. Drawings of the application and the results of the Examples show that the effect of Applicants' coating is to improve performance at low and normal temperatures by decreasing the gradient of temperature and pressure. In fact, scrutiny of Figures 1 and 2 reveals that the initial changes at lower temperatures causes a slope difference of positive (for coated granules of the invention) compared to a negative slope (for uncoated granules).

Applicants respectfully traverse the rejections of claims under 35 U.S.C. 103 over O'Meara in view of Lutz. In applicants' view, the combination of the descriptions fails the test set forth in *In re Vaeck*:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The

teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The U.S. Patent to O'Meara (5,682,009 – column 1, line 37, *et seq.*) relates to a particulate 10 in which is dispersed a deterrent 16. Suitable deterrents include polyvinyl acetate, polystyrene, polyethylene, polyisoprene, and cellulose acetates. These contain different materials. In addition, O'Meara relates that "to enhance flow, the particulates may be coated with graphite, (column 5, lines 55-60). The structures of Applicants' claims 43, 60 *et seq* do not follow from the O'Meara reference. None of these materials is relevant to Applicants' claims.

Lutz (U.S. 5,520,757) discloses a fundamentally different method, from applicants' claims. The object of the Lutz method is the production of a base material for the propellant powder, and the reference is not directed to the surface treatment for influencing the combustion behavior. Applicants claim the use of nitro ethyl nitramines as surface coating means in different powder formulations. The cited reference does not provide any suggestion to surface-treat propellant powder or propellant grains. Please see Lutz column 2 lines 1 *et seq*, which recites:

"The present invention provides a composition and method of manufacturing mixtures of two or more of the compounds alkyl-NENA and DINA. In one aspect of the the invention relates to the mixtures of these compounds...In another aspect, the invention relates to the formation of colloids of these mixtures with nitro cellulose to provide improves propellants. "

Moreover, the Lutz reference does not make up for the deficiencies of the O'Meara reference. The cited reference does not provide any suggestion to surface-treat propellant powder or propellant grains. Please see column 2 lines 1 *et seq*, which recite

"The present invention provides a composition and method of manufacturing mixtures of two or more of the compounds alkyl-NENA and DINA. In one aspect of the the invention relates to the mixtures of these compounds...In another aspect, the invention relates to the formation of colloids of these mixtures with nitro cellulose to provide improves propellants. "

Applicants respectfully request withdrawal of the rejections under 35 U.S.C. 103, over O'Meara in view of Lutz as the combination of references fails to describe or suggest [provide motivation or expectation] of the rejected subject matter.

Applicants respectfully traverse the rejections of claims under 35 U.S.C. 103 over Boileau in view of Haaland. Boileau (837) differs from the subject matter of our application in that it relates only to propellant charges for small and medium caliber ammunition without cartridge cases, wherein propellant powder is pressed into solid propellant blocks with the aid of dinitro polystyrene, polyvinylacetate and/or polyvinyl nitrate. These blocks are intended to be used for ammunition without cases, which also differs from the subject matter of our application. In contrast to our application, it is the object of reference '837 to produce a high charge density. For the purpose of producing compact charges to improve the stability of the ammunition without cases, a bonding agent is used for the propellant charge and it is compressed, so that the propellant charge does not fall apart after the pressing. Reference 837 thus initially adds a bonding agent to a loose propellant charge powder and subsequently compresses the charge in a pressing operation.

In contrast to these steps, our invention in particular does not provide a loose propellant powder with bonding agent, but calls for coating a finished propellant grain with different types of desensitizing agents, wherein the coating according to our invention primarily functions to

produce bulk powders with reduced temperature gradients, which differs from the subject disclosed in 837. The reference 837 consequently does not relate to the combustion behavior of coated propellant grains, as suggested according to our invention.

To be sure, the cited US reference "Haaland" (US-PS 5,759,458) relates to the production of high-performance propellant powders for barrel weapon ammunition. However, it contains high shares of crystalline materials such as hexogen, which are worked with the aid of extruders into a matrix of the energetic binder. The share of the energetic binder or plasticizing agent in this case is approximately 15-30%. In contrast to our application, the energetic material is not described as combustion moderator for influencing the temperature gradient, but as a matrix for working in crystalline energy carriers such as RDX and CL 20, which in turn are present in a typical powder form, as shown in the illustration filed with the US Patent Office. Viewed in this way, we can state that both of the above-mentioned references have nothing in common with our invention, with respect to the object as well as the solution.

Based on our understanding, the crucial point of the rejection rests with the interpretation of the terms "mixing" and "dispersing." We definitely cannot agree with the Examiner's arguments because in our view, "mixing" or "dispersing" is used for combining different substances for producing a "homogeneous, uniform body." According to our invention, however, an additional substance is deposited onto the surface of an already finished propellant grain and/or into the holes, wherein this substance is not uniformly distributed in the powder grain but is concentrated on the surface. In contrast, the "dispersing" and "mixing" operation does not result in a concentration gradient, as is the case with the invention.

In summary, we can state that even viewing the aforementioned references in combination, it does not lead to the problem definition of our application, namely lowering the



temperature gradient during the combustion of the propellant powder. The known substances do not provide any reference to this effect.

Experience shows that the known substances of a group cannot be exchanged. For that reason, the coating substances used according to the invention do not suggest themselves on the basis of the prior art. The Examiner's attention is respectfully directed to pages 3-4 of the enclosed translation of arguments (advanced in the EPO) pertaining to the issue of non-equivalence of certain compositions used in this art:

“The reference D3 discloses applying a coating in several stages by means of a solution of, for example, nitroglycerine. The substance nitroglycerine is an energetic monomer substance with the disadvantage of a high sensitivity, in particular sensitivity to impact, and is not used for the deployment range according to the invention. Centralit is also listed as example herein, which has the disadvantage of binding well with the powder matrix and is not suitable for use with the invention because of its high migration.

The examples in reference D3 already show that the problem cannot be solved, for example, through a general listing of the energetic monomers nitroglycerine and centralit.

The energetic polymer of the type polyvinylnitrate, disclosed in reference D5 (D5, example 1 on page 5), cannot lead to the substances according to our invention because polyvinylnitrate - besides being hard to obtain - as powdery thermoplastic substance is not very suitable for use as a surface treatment.

The aforementioned arguments already show that the above-mentioned energetic monomers and energetic polymers in no way can be used to replace the substances according to our invention because of the different properties. The substances

according to the invention are not comparable to the monomers and polymers disclosed in prior art. It is therefore not possible to use any optional monomer or polymer substance to solve the object. Rather, the person skilled in the art must use inventive activity to arrive at the solution features as disclosed in claim 1.

The cellulose derivatives disclosed in reference D4 and mentioned in Point 2.2 of the Office Action belong to the group of polyesters and cannot be considered polyether substances because the molecules have a different composition. The polyether substances disclosed for our invention are not cellulose derivatives belonging to the group of polyesters (ethers), but are cyclical aliphatic polyethers. The use of polyester, however, results in a not inconsiderable reduction in the specific energy. For that reason, the use of cellulose derivatives (polyester) cannot satisfactorily solve this object.”

Applicants respectfully request withdrawal of the rejections under 35 U.S.C. 103, over Boileau et al in view of Haaland et al. as the combination of references fails to describe or suggest [provide motivation or expectation] of the rejected subject matter.

Reconsideration of the outstanding Office Action and an early allowance of the application are respectfully solicited.

Respectfully submitted,

Dated: Nov 26, 2004 <sup>5</sup>



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